Chapter 2

Acute lower abdominal pain in women of reproductive age

Diagnosis of acute lower abdominal pain in women is a challenging clinical scenario as information from history taking and physical examination is often non-specific. Clinical presentations are similar in a variety of conditions.

Diagnosis concerning abdominal pain in women requires some specific considerations. As gynecological conditions and pregnancy related complications are exclusive to women, history taking from all female patients with abdominal pain should include inquiries about gynecology symptoms, birth control and menstruation in addition to questions about pain and GI symptoms. Pelvic examination has limitations in differentiating between causes of pain due to low validity and low reliability.[1-3] Differential diagnoses of acute non-traumatic abdominal pain in women are ectopic pregnancy, complicated functional ovarian cysts, adnexal torsion, pelvic inflammatory disease, endometriosis, appendicitis, diverticulitis and incarcerated hernia.[4] Common diagnoses of acute lower abdominal pain are appendicitis, pelvic inflammatory disease, ectopic pregnancy and ovarian cyst.[5]

The significance of these conditions in Thailand is also not trivial. According to the report produced regarding hospitalized patients in 2010 by the Bureau of Policy and Strategy of Ministry of Public Health, appendicitis caused hospitalization at an incidence of 171.53 / 100,000 of the female population.[6] Hospital admissions for pelvic inflammatory disease, ectopic pregnancy and ovarian cyst occurred at incidences of 120.68, 104.34, and 23.89 / 100,000 of the female population respectively.

1.Summary of the common conditions that cause acute lower abdominal pain in females of reproductive age

1.1 Appendicitis

It has been estimated that the risk of appendicitis in a lifetime is 8.6% for men, and 6.7% for women.[7] Appendectomy is the most common emergency operation performed; however, the negative appendectomy rate is quite high, especially in females of reproductive age. Without imaging, negative appendectomy cases in this group were as high as 24.7%.[8] Abdominal pain is the prominent symptom. Typically, pain starts in the central abdominal area for 4-6 hours, then moves to the right lower quadrant. Most patients experience associated gastro-intestinal symptoms such as

anorexia, nausea and vomiting. Vomiting usually occurs after the onset of abdominal pain, if not, diagnosis of appendicitis is questionable.

Low-grade fever is common in appendicitis. Temperature elevation rarely exceeds 1 degree Celcius. Tenderness at Mc Burney's point [9], direct rebound tenderness and indirect rebound tenderness are common presentations. Inflammation involving the parietal peritoneum causes muscle resistance, or guarding, on palpation. If the disease progresses to a case of a ruptured appendix, symptoms and signs of peritonitis are more prominent. In a delayed case, a patient with ruptured appendicitis may presented with generalized abdominal pain and generalized abdominal tenderness; however, a careful history taking would reveal a progression from right lower quadrant pain to generalized pain which suggests ruptured appendicitis as the cause of peritonitis. The most useful laboratory test to inform diagnosis is a complete blood count. Mild to moderate leucocytosis (10,000 to 18,000 cells per milliliter) is typical in a positive diagnosis. Lack of white blood cells in urinalysis data is also useful in ruling out the possibility of a urinary tract infection; however, white blood cells can be found in urine without a urinary tract infection due to bladder irritation from appendicitis.

Although diagnosis of appendicitis in typical cases is not difficult, different locations of the appendiceal tip and different stages of the disease may confound the correct diagnosis. Previously, surgeons may have accepted a negative appendectomy rate of up to 20-30% for fear that if a case of appendicitis was missed a ruptured appendicitis may result and more severe consequences would ensue. However, negative appendectomies have become more unacceptable. Clinical policies have been developed to reduce unnecessary negative appendectomies. Imaging studies are helpful in the diagnosis of appendicitis and the effectiveness of these in reducing negative appendectomies have been well documented.[8] Computerized tomography and ultrasonography have been suggested to confirm the diagnosis of appendicitis in equivocal cases.[10]

1.2 Gynecological conditions

In women of reproductive age, gynecological conditions are the most common findings in cases of negative appendectomy.[11] Pelvic inflammatory disease, ectopic

pregnancy, ovarian cyst (including functional cyst) and endometriosis are all common causes of pelvic pain.

1.2.1 Pain pelvic inflammatory disease (PID) is a term used to describe infection of the uterus, fallopian tube and / or the ovary. Incidence of hospital admission from PID has declined since 1990. In typical cases pain usually presents on both sides of the pelvis. Pelvic examination that reveals a purulent discharge from the cervical os, bilateral adnexal tenderness and cervical motion tenderness confirms the diagnosis of pelvic inflammatory disease in typical cases. A cervical discharge smear test and a laparoscopy are helpful in the diagnosis of PID. A clinical diagnosis of PID requires the minimal criteria listed below and one or more additional criteria.

Table 2.1 Criteria for the clinical diagnosis of PID[12]

Minimal criteria	Additional criteria
Pelvic examination shows cervical motion tenderness, or uterine tenderness, or adnexal tenderness.	• oral temperature >38.3° C; • purulent vaginal discharge; • vaginal smear fluid showing numerous WBC; • elevated erythrocyte sedimentation rate; • elevated C-reactive protein; • laboratory confirmation of cervical infection with *N. gonorrhoeae* or *C. trachomatis*.

Risk factors for PID are multiple sexual partners and use of an intrauterine contraceptive device (IUD).

The wide-spectrum of clinical findings in PID leads to possible inaccuracies in clinical diagnosis. The more specific methods for diagnosis of PID are endometrium biopsy, transvaginal ultrasonography, MRI and laparoscopy.[13]Eschenbach[14] stated that from a total of 1066 clinical diagnoses of PID, only 62% were correctly diagnosed by clinical means when compared with those confirmed by laparoscopic findings (reference standard). The remaining 22% were described as normal, 5% were cases involving ovarian cysts, 4% were

cases of ectopic pregnancies, 3% were cases of appendicitis, 1% showed endometriosis and 3% were other conditions.

Treatment of PID is usually by antibiotic therapy. Patients may need hospitalization if severe conditions present, if the patient is pregnant or there is an uncertainty in diagnosis. PID associated with a ruptured abscess requires an emergency laparotomy. A total hysterectomy with a bilateral oophorectomy is advised for cases of ovarian abscess because of poor tissue penetration of antibiotics into the ovaries. When surgery is performed on a patient with PID due to a misdiagnosis of appendicitis, only collection of a bacteriological specimen and antibiotic treatment is advised.

1.2.2 Ectopic pregnancyoften presents with the classical clinical triad of abdominal pain, amenorrhea and vaginal bleeding. However, the classical triad can be found in only 56.3% of cases. Common clinical findings (and percentage of presentation) in cases of ectopic pregnancy are: abdominal pain (70%), rebound tenderness (51%), cervical motion tenderness (62.5%), positive urine human chorionic gonadotropin (HCG) (96.9%) and positive plasma HCG (97.4%).[15]

Some clinical findings in the history and physical examination of patients show an increased possibility of ectopic pregnancy. Risk of ectopic pregnancy is higher in patients with moderate to severe sharp lateral pain, a history of use of an intrauterine contraceptive device, infertility and previous pelvic surgery (including tubal ligation). If the uterus was enlarged displaying development of dimensions of a typical pregnancy of more than 8 weeks and there was pain in the midline there is a decreased possibility that the cause was an ectopic pregnancy. However, there is no reliable history and physical examination that can exclude an ectopic pregnancy.[16] History taking to delineate pain characteristics and a physical examination to identify the degree of peritoneal irritation, also help to clarify the risk stratification of patients with ectopic pregnancy.[17, 18]

Ultrasonography is the preferred imaging investigatory technique for diagnosis of ectopic pregnancy in an early pregnancy presenting with lower abdominal pain or vaginal bleeding.[19]Transvaginal ultrasound is accurate to demonstrate the intrauterine pregnancy while non-diagnostic ultrasound results need evaluation of beta-hCG levels to identify abnormal gestation. Serial quantitative beta-hCG, in conjunction with

transvaginal ultrasound, is a very sensitive test enabling the detection of an ectopic pregnancy.[20]

1.2.3 Ovarian cyst torsion is an uncommon cause of acute lower abdominal pain. It causes severe unilateral pain and an emergency operation is necessary. Rupture or leakage of serious cysts and functional ovarian cysts are more common. Acute sharp lower abdominal pain, improving after a period of time, is the most common presentation. Ultrasonography, CT or laparoscopy can confirm these diagnoses. Treatment of ovarian cyst rupture, if diagnosed early, is conservative without surgery.

1.2.4 Endometriosis is generally the cause of chronic pelvic pain rather than acute discomfort. It can cause acute pelvic pain if any endometriotic cysts rupture. The clinical presentation of the rupture of an endometriotic cyst mimics the symptoms synonymous with a ruptured ovarian cyst.

1.3 Other causes of acute lower abdominal pain

Acute mesenteric lymphadenitis, although common in children, it is not usually the cause of abdominal pain in adult females. Colonic diverticulitis, on the other hand, can affect females, particularly during the fourth decade. Diverticulitis in the ascending colon is usually undistinguishable from appendicitis. Urinary tract infection and urethral stones are also causes of acute lower abdominal pain.

Non-specific abdominal pain (NSAP)

The term 'non-specific abdominal pain' refers to abdominal pain with no specific diagnosis. Even a laparoscopy or CT scan cannot provide a specific diagnosis for every NSAP.[21] Although NSAP is considered a temporary condition, it can affect long term outcomes such as chronic abdominal pain and peptic ulcers. Compared to acute appendicitis, NSAPs patients tend to experience more incidence of abdominal pain and higher mortality in the long term.[22] To date, there is no optimal treatment for NSAP. In this thesis, the researcher also categorized non-appendicitis and non-gynecological conditions as NSAP.

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